

Amendment and Response Under 37 C.F.R. 1.116

Applicant: Clyde M. Guest et al.

Serial No.: 09/848,479

Filed: May 3, 2001

Docket No.: A126.164.102 (Previously: B63814C-013377-0084)

Title: SYSTEM AND METHOD FOR SELECTION OF A REFERENCE DIE**REMARKS**

The following remarks are made in response to the Final Office Action mailed April 26, 2004. In that Office Action, the Examiner objected to claim 98 under 37 C.F.R. §§1.75(a) and 1.75(d)(1) as failing particularly point out and distinctly claim the subject matter which the Applicant regards as the invention, and for failing to conform to the invention as set forth in the remainder of the specification.

Claims 73-98 were rejected under the judicially created Doctrine of Obviousness-Type Double Patenting as being unpatentable over claim 26 of Guest et al., U.S. Patent No. 6,252,981 ("Guest Parent Application").

Claims 73-75, 79-81, and 90-92 were rejected under 35 U.S.C. §102(e) as being anticipated by Sumie et al., U.S. Patent No. 5,943,437 ("Sumie").

Claims 90-92, and 98 were rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Sumie and Schemmel et al., U.S. Patent No. 5,943,551 ("Schemmel"). Claims 76, 82, 83, 86, 87, and 93 were rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Sumie and Miyazaki, U.S. Patent No. 6,031,607 ("Miyazaki"). Claim 98 was rejected under 35 U.S.C. §103(a) as being unpatentable over Sumie in view of Khalaj et al., U.S. Patent No. 5,513,275 ("Khalaj"). Claims 78, 96, and 97 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sumie in view of Berezin et al., U.S. Patent No. 5,539,752 ("Berezin"). Claims 76, 82-89, and 93 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sumie in view of Brecher et al., U.S. Patent No. 5,544,256 ("Brecher"). Claims 77, 94, and 95 were rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Sumie and Michael, U.S. Patent No. 5,640,200 ("Michael"). Claims 94 and 95 were rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Sumie and Schemmel as applied to claim 90 above, and further in combination with Michael.

With this Response, claims 73, 90, and 98 have been amended. Claims 73-98 remain pending in the application and are presented for reconsideration and allowance.

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Title: SYSTEM AND METHOD FOR SELECTION OF A REFERENCE DIE**37 C.F.R. §1.75 Objection to Claim 98**

The Examiner objected to claim 98 under 37 C.F.R. §§1.75(a) and (d)(1) as failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention, and for failing to conform to the invention as set forth in the remainder of the Specification. With this Amendment and Response, claim 98 has been amended to incorporate the changes suggested by the Examiner at pages 2-3 of the above-referenced Office Action. Therefore, it is believed that claim 98 meets the requirements of 37 C.F.R. §1.75, and as a result, withdrawal of the Examiner's objection on that basis is respectfully requested.

Double-Patenting Rejections

The Examiner rejected claims 73-98 under the Judicially created Doctrine of Obviousness-Type Double Patenting as being unpatentable over claims 1-26 of US Patent No. 6,252,981. A Terminal Disclaimer in compliance with 37 C.F.R. §1.321(c) has been appended to this Response in order to overcome the Examiner's rejection. As such, withdrawal of the Examiner's rejection on double patenting grounds is respectfully requested.

Support for Claim Amendments to Claims 73 and 90

It is respectfully submitted that the amendments to claims 73 and 90 are adequately supported by the Specification, and otherwise meet the statutory requirements for patentability. For example, at page 4, lines 12-17 of the Specification it is taught that one aspect of the present invention eliminates the need for an operator to manually view and select dies that would be used for comparison in determining a reference die. For further support, the Examiner may refer to page 7, lines 16-21; page 8, lines 10-17; and page 18, lines 17-23, for example.

Claim Rejections under 35 U.S.C. §§102(e) and 103(a)

Claims 73-75, 79-81, and 90-92 were rejected under 35 U.S.C. §102(e) as being anticipated by Sumie. Independent claim 73 as amended relates, in part, to a system for selection of a reference die image comprising: a die image comparator operable to create a difference image without a manually selected reference image, wherein the difference image is based upon

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a first die image and a second die image; and a difference image analysis system coupled to the die image comparator, operable to determine whether the first die image and the second die image may be used as the reference die image. For at least the reasons described below, the cited references fail to teach or suggest limitations of claim 73 as amended.

In particular, Sumie does not teach or suggest creating a difference image without a manually selected reference image as required by the limitations of claim 73 as amended. At column 7, lines 50-57 of Sumie (as cited by the Examiner at page 16 of the above-referenced Office Action) it is taught that "the reference image data ID_r [can be]... generated by applying image processing, ... based on design data... , or... data obtained by picking up an image of a portion of the surface... where there is no defect." At page 17 of the office action, the Examiner indicates that Sumie discloses how an image of a portion of the surface where there is no defect can be determined at column 8, lines 46-60. In that passage, Sumie discloses that "a defect portion can be extracted by comparing the pieces of luminance information LI_1 , LI_2 of the dies with each other." Sumie indicates that "when the same part of three dies is extracted by the inventive method, if the pieces of luminance LI_1 , LI_2 substantially agree within a specified tolerance, no defect is determined to exist in the test regions of the three dies." However, "if the pieces of luminance information LI_1 , LI_2 extracted from one die differ from those extracted from the remaining two dies, a defect exists in the test region of this one die." As the Examiner's argument goes at page 17 of the Office Action, in this manner Sumie teaches, "a position where no defect exists is further picked up to use as a reference image." (Sumie, column 9, lines 1-5).

Sumie cannot teach a difference image without a manually selected reference image as required by the limitations of claim 73 as amended, because Sumie indicates that luminance information LI_1 , LI_2 is extracted for each die prior to comparing them. In particular, all embodiments of the inventive method for acquiring luminance information LI_1 , LI_2 require both an inspection image I_b and a pre-stored reference image I_r . (Sumie, for example, Figs. 8, 13, 16, 17, & 18). Although Sumie discloses that a position determined to have no defect may be further picked up to use as a reference image, that occasion must always be associated somehow with a previously, manually selected reference image. In other words, under the inventive method of Sumie, one must first have a reference image to calculate LI_1 , LI_2 for each die prior to comparing

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LI₁, LI₂ of the dies with each other in order to obtain a new reference image by "picking up an image of a portion of the surface... where there is no defect." That new reference image will be associated with the manually selected reference image, and similarly, any difference image I_d created via comparison of the new reference image I_c with an inspection image I_b will be associated with the previous, manually selected reference image.

Thus, Sumie inherently fails to teach the limitations of claim 1 as amended because any difference image I_d depends from a manually selected reference image. In fact, failure to provide a "prestored reference image I_c" (column 7, lines 63-67) would defeat the functionality of the method of Sumie. Thus, Sumie, in fact, teaches away from a comparator operable to create a difference image without a manually selected reference image, wherein the difference image is based upon a first die image and a second die image as required by the limitations of claim 73 as amended. In light of the above, it is believed that claim 73 as amended presents patentably distinct material from the reference cited against it.

Independent claim 90 as amended includes limitations similar to those discussed above in association with claim 73 as amended. In particular, claim 90 as amended relates, in part, to a method for selecting a reference die image comprising: subtracting a first die image from a second die image to create a difference image, without utilizing a manually selected reference image. Therefore, claim 90 is believed to present patentably distinct material from the reference cited against it for reasons similar to those described above in association with claim 73 as amended.

The Examiner rejected claims 76-78 and 82-98 under 35 U.S.C. §103(a) as being unpatentable over Sumie and one or more of: Schemmel, Miyazaki, Khalaj, Berezin, Brecher, and Michael. In rejecting claims 76-78 and 82-98 the Examiner relies on Sumie to teach or suggest a difference image per the limitations of these claims. As described above, Sumie does not teach or suggest either: A system for selection of a reference die image comprising: a die image comparator operable to create a difference image without a manually selected reference image as required by the limitations of claim 73 as amended; or, A method for selecting a reference die image comprising: subtracting a first die image from a second die image to create a difference image, without utilizing a manually selected reference image as required by the

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limitations of claim 90 as amended. Furthermore, it is believed that incorporating such limitations with the method and apparatus of Sumie would either render Sumie unsatisfactory for its intended purpose or change Sumie's principle of operation. MPEP §2145(X)(D). In other words, Sumie taken as a whole teaches away from such limitations as it would require abandonment of calculating LI_1 , LI_2 as required by the inventive method of Sumie.

Further, as recognized by the Examiner, none of the cited references teach or suggest the difference image of independent claims 73 or 90, from which claims 77-78, 82-90 and 91-98 depend. For example, Schemmel relates to acquisition of a random sample of die images to create a statistical die model or standardized die image, which is then compared to dies images on a silicon wafer to determine if the silicon dies have surface defects. Schemmel, column 1, lines 60-67 to column 2, lines 1-2. Michael, for instance, relates to a difference image resulting from comparison of a test image and a golden template image. Michael, column 3, lines 34-36. Miyazaki relates to obtaining a difference image from a difference between a detection image and reference images. Miyazaki, column 3, lines 20-30. With respect to Berezin, the Examiner relies on that disclosure for teaching "a warning when 'defect density, or number of defects per die, exceeds pre-selected perimeters.'" Office Action dated 4/26/04, page 12. Berezin relates to storing a database of defects to facilitate classification. Berezin, column 5, lines 46-66. Brecher relates to a difference image based on an original image minus a golden template. Office Action dated 4/26/04, page 13 and Brecher, column 13, lines 25-30. In light of the teachings of the cited references, independent claims 73 as amended and 90 as amended, as well as claims 74-79 and 91-98 depending therefrom, are believed to present patentably distinct material from the cited references. As such, withdrawal of the Examiner's rejection of claims 73-98 is respectfully requested. In addition, allowance, and notification to that effect are requested.

CONCLUSION

In view of the above, Applicant respectfully submits that pending claims 73-98 are in form for allowance and are not taught or suggested by the cited references. Therefore, reconsideration and withdrawal of the rejections and allowance of claims 73-98 is respectfully requested.

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No fees are required under 37 C.F.R. 1.16(b)(c). However, if such fees are required, the Patent Office is hereby authorized to charge Deposit Account No. 50-0471.

The Examiner is invited to contact the Applicant's representative at the below-listed telephone numbers to facilitate prosecution of this application.

Respectfully submitted,
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CERTIFICATE UNDER 37 C.F.R. 1.8:

The undersigned hereby certifies that this paper or papers, as described herein, are being transmitted by facsimile to the Patent and Trademark Office, at (703) 872-9315 on this 3rd day of August, 2004.

By: 

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